EEL4215 – Power Systems III
Three Credits, Two and a half hours, Engineering Topic.

Instructor: Dr. Sumit Paudyal.

Textbook: Power System Analysis and Design Authors: D. Glover, T. Overbye, and M. S. Sarma

Specific Course Information:
Short circuit calculations, symmetrical and unsymmetrical fault analysis, transient stability and
dynamic studies as well as power system control. Computer applications.

Specific Goals for the Course
a. Specific outcomes of instruction
Upon successful completion of this course, the student will:
1. Apply computational methods for Load Flow Analysis
2. Apply Advanced Fault Analysis Methods
3. Compute Economic Load Dispatch Solutions and Optimal Power Flow for electric power systems
4. Synthesize Power Grid Load-Frequency Relation
5. Analyze the stability of power grids following disturbances.
b. Explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes
are addressed by the course.
In this course the student will have to show
(a) an ability to apply knowledge of mathematics, science, and engineering (X)
(b) an ability to design and conduct experiments (simulations), as well as to analyze, interpret data
(N/A)
(c) an ability to design a system, component, or process to meet desired needs (X)
(d) an ability to function in multi-disciplinary teams (N/A)
(e) an ability to identify, formulate, and solve engineering problems (homework) (X)
(f) an understanding of professional and ethical responsibility (X)
(g) an ability to communicate effectively (through project reports) (X)
(h) the broad education necessary to understand the impact of engineering solutions in
a global and societal context (X)
(i) a recognition of the need, and an ability to engage in life-long learning (X)
(j) a knowledge of contemporary issues (X)
(k) an ability to use the techniques, skills, and modern engineering tools necessary for
engineering practice (X)
(l) a knowledge of probability and statistics (X)

Brief list of the topics to be covered
1. Review of p.u. system, Nodal Analysis, Y-bus matrix
2. Power Flow Analysis s
3. Power Flow Analysis using Software Tool
4. Symmetrical Fault Analysis
5. Symmetrical Fault Analysis using Software Tool
6. Symmetrical Components
7. Asymmetrical Fault Analysis
8. Economic Load Dispatch
9. DC Power Flow
10. DC Optimal Power Flow
11. Power System Control
12. Load-frequency Control
13. Power System Dynamics and Stability
14. Equal Area Criterion, Critical Clearing Time

**GRADING:**

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**Conversion of Numerical Grade to Letter Grade**

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